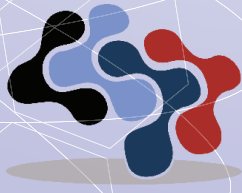


IMPACT

REPORT

2021-2022



Center for Clinical
and Translational Science

Contents

Welcome Note from the Director	3
Mission Statement	3
Aims of our CTSA Grant	4
Partners and Affiliates	4
UMCCTS by the Numbers FY22	5
In the News	6
2022 Highlights and Achievements	7-11
- Education and Workforce Development	7
- KL2 Scholars	7
- TL1 Trainees	8-9
- PEPP	10
- Clinical Research Professionals Summer Internship	11
Community Engagement and Collaboration Core (CECC)	12
Biomarker Core: Proteomics/Olink	13
Science Participation Resource Center (SPRC)	13
Clinical Research	14
COVID Response	15-16
Informatics	16
Biostatistics, Epidemiology, and Research Design (BERD)	17
Biospecimen, Tissue and Tumor Bank	17
Pilot Awards	18-20
Research Infrastructure	21
UMCCTS Leadership, Operations, Services	22

Welcome Note from the Director

I am pleased to present this report highlighting the exciting and important work completed in the 2nd year of our third NIH Clinical and Translational Science Award (CTSA) grant. The tremendous effort supporting the UMCCTS vision to improve health and healthcare delivery by advancing the science of translation and by supporting a robust translational workforce speaks to the commitment of our team of leaders, researchers, and staff.

As the COVID-19 pandemic transitioned to an endemic phase over the past year, our focus transitioned from COVID-19 response efforts back to a wide range of translational research efforts. We were able to capitalize on experiences during COVID-19 studies, including implementation of mRNA vaccines clinical trials, and apply newly acquired expertise to a wider range of research areas. Our informatics team, instrumental in providing data to the National COVID Cohort Collaborative (N3C) during the pandemic, streamlined operational services, and developed a concierge service for our researchers. Community connections, which were strengthened during the pandemic, continue to be strong and to inform our research efforts.

Recognizing the challenges of training and retaining skilled researchers, we established novel programs to engage undergraduate students from our UMass sister campuses in translational research. You will see their stories highlighted in this report. Many thanks to our collaborating partners, community partners, researchers, stakeholders, and funders. We have a truly dedicated team of researchers and staff, and I look forward to continuing our important work over the next few years.

Katherine Luzuriaga, M.D.

PI and Director, UMass Center for Clinical and Translational Science
Vice Provost, Clinical and Translational Research
UMass Memorial Health Care Endowed Chair in Biomedical Research
Professor, Program in Molecular Medicine
Pediatrics and Medicine



Vision & Mission Statement

Vision

The UMCCTS works in collaboration with our clinical partners to improve health and health care delivery by:

- Advancing the science of translation;
- Catalyzing high quality research across the translational spectrum; and
- Building and supporting a robust translational workforce

Mission

The UMCCTS provides cores, services, funding, education and training that catalyze new ways of doing translational science, supports trans-disciplinary collaboration, and educates the next generation of clinical and translational researchers.

CTSA Specific Aims

- **Workforce Development:** Build and support a trans-disciplinary Clinical and Translational Research (CTR) workforce with the knowledge, skills, and institutional environment to advance high-impact translational research
- **Collaboration/Engagement:** Engage stakeholders throughout the translational process to optimize evidence-based, community-integrated research practices and apply these practices to specific projects that improve individual and population health
- **Integration Across the Lifespan & Underrepresented or Disadvantaged Populations:** Improve insights and practices that ensure that discoveries are translated to all who might benefit
- **Methods & Processes:** Develop, test, and share innovative solutions to critical gaps in the translational research process from discovery to community
- **Informatics:** Develop, demonstrate, and disseminate informatics innovations that accelerate both translational science and translational research operations and that provide the essential evidence base for learning health systems

Partners and Affiliates

CTSA Consortium

Informatics:

- Our informatics team was among the first 15 hubs to contribute COVID-19 related clinical data from electronic health records to the National COVID Cohort Collaborative (N3C).
- Projects using N3C data have resulted in 16 publications in FY22. <https://ncats.nih.gov/n3c>

Entrepreneurship:

- I-Corps @ UMass hosted a virtual short course in October-November 2021. 8 teams (a total of 15 individuals) participated from University of Wisconsin-Madison, commercial companies, Columbia University, and UMass Chan.
- Instructors from 5 institutions (Rockefeller University, Columbia University, University of Rochester, Medical College of Wisconsin, University of Wisconsin-Madison) observed the courses.

Community:

- A cross-CTSA special seminar entitled “Community-Based Approaches to Promoting Behavioral Health Equity: A Call to Action”, was hosted jointly with the Morehouse/Georgia CTSA, UC Davis, University of Florida, and Health Education Council, CA.
- The Strengthening Translational Research in Diverse Enrollment (STRIDE) team has begun disseminating the products developed by this NCATS-funded award. All dissemination materials are available for download from the website www.strideproject.org.
- The storytelling team presented a two-part Trial Innovation Network webinar attended by nearly 90 people and created a toolkit for study teams to create their own video stories.

UMCCTS by the Numbers

6

KL2 AWARDS

10

PILOT AWARDS

8

MSCI SUPPORTED

1436

TRACs REQUESTS

332

UNIQUE USERS

Registry Requests

Research Match: **3** Studies

Conquering Diseases Web Site: **Average 150** Searches Per Day

Navigation/recruitment consults: **6** Study Teams

Publications (UMCCTS supported, KL2 & TL1): **167**

Relative Citation Ratio (Mean) iCite Papers published in 2021: **6.81**

In the News

[PhD candidate investigating pediatric blood pressure screening practices receives highly competitive NIH Kirschstein Award](#)

Melissa Goulding, BS, MS, PhD student | Previous TL1 Trainee

[Prestigious NIH Kirschstein Award to Fund MD/PhD Student's Research into Impact of Structural Racism on Health](#)

Zach Dyer, MPH, MD/PhD student | Previous TL1 Trainee

[Research from UMass Chan, UMass Amherst, and Baystate Health can help create a playbook of 'promising practices' for jails across the U.S., Massachusetts jails found 'innovative solutions' to implement medical treatment for opioid use disorder](#)

Ekaterina Pivovarova, PhD | Previous KL2 Scholar

[FDA Announces Recommendations Based on New Study Highlighting Serial Testing with Rapid Antigen Tests](#)

[Finding a Vaccine for Epstein Barr Virus](#)

[UMass Chan Scientists Develop Web App for Visualizing Locality of Covid-19 Variants Clinical Data](#)

[PTC Therapeutics Announces European Commission Marketing Authorization for Upstaza](#)

'29 Who Shine' honoree

Massachusetts recognizes UMass Medical School MD/PhD candidate for outstanding service focused on health equity in U.S. and abroad

Apurv Soni, MD
Previous TL1 trainee

Guest Commentary:

Here's the Difference Between PCR and Antigen COVID-19 Tests

A molecular biologist breaks down the science about the COVID-19 tests

Nathaniel Hafer, PhD
CCTS Operations
Director

UMass Worcester Prevention Research Center Targets COVID-19 Spread in the Community

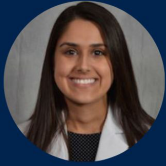
Prevention Research Center and community partners expand on efforts

Stephenie P. Lemon, PhD, MS
CECC Co-Director

Highlights and Achievements

Education and Workforce Development

KL2 Scholars 2022



Nisha Fahey, DO

Department of Pediatrics; Population and Quantitative Health Sciences
Mentors: Jeroan Allison, MD, MS; Arvin Garg, MD, MPH
Project Title: Enabling Community-Based Kangaroo Care to Mitigate Health Inequities Among Preterm Infants



Lara Kovell, MD

Department of Medicine, Division of Cardiology
Mentor: David McManus, MD, ScM
Project Title: Development of a Mobile Health Intervention for Blood Pressure Management in Pregnancy



Laurel O'Connor, MD

Department of Emergency Medicine
Mentor: Edwin Boudreaux, MD
Project Title: A mobile Integrated Health Intervention for the Management of Acute-Phase Exacerbation of Congestive Heart Failure and Chronic Obstructive Pulmonary Disease



Martha Zimmermann, PhD

Department of Psychiatry
Mentor: Nancy Byatt, DO, MBA, MS, DFAPA, FACLP
Project Title: Developing a Scalable Intervention to Prevent Perinatal Anxiety in Obstetric Settings

KL2 Scholars 2020



Patricia Cho, MD

Department of Urology
Mentor: Beth McCormick, PhD & Jane Freedman, MD
Project Title: Gut Microbiome and Apolipoproteins in Recurrent UTI and Renal Damage



Ayorkor Gaba, Psy.D.

Department of Psychiatry
Mentor: David Smelson, Psy.D.
Project Title: Advancing Behavioral Health Equity for Justice-Involved Adults



Chris Hemond, MD

Department of Neurology
Mentor: Robert Brown, MD, DPhil
Project Title: Translational MRI and Immunological Predictors of Neurodegeneration in Multiple Sclerosis: Exploring Memory B-Cell and Monocyte Populations



Sohye Kim, PhD

Department of Psychiatry
Mentor: Jean Frazier, MD
Project Title: Establishing Novel Neural Markers that can Detect Individual Differences in the Developing Brain's Capacity to Respond to Social Cues



“The KL2 program has provided me with many great opportunities by enabling me to complete specialized training

in innovative areas such as clinical informatics and behavioral economics, strengthen collaborations with clinical partners, and conduct critical formative work on an intervention designed to support patients with the self-management of their diabetes.”

Dr. Daniel Amante - KL2 Scholar

Highlights and Achievements

T L I T R A I N E E S



Esther Boama-Nyarko, MPH

Postdoctoral Fellow

Mentor: Stephenie Lemon, PhD

Project Title: Examining Mental Health Treatment in Perinatal Women Involved in MCPAP for Moms vs PRISM: Challenges and Considerations



Zachary Dyer, AB, MPH

MD/PhD track

Mentors: Jay S Himmelstein, MD, MPH & Arlene S Ash, PhD

Project Title: The Public-Private Payer Price Gap and its Impact on Equity



Katarina Ferrucci, BA, MS

PhD student

Mentor: Kate Lapane, PhD, MS &

William Michael Jesdale, PhD

Project Title: Evaluation of Eating Disorder Prevalence and Provider Clinical Climate in the Treatment and Diagnosis of Eating Disorders Among US transgender adults



Melissa Goulding, BS, MS

PhD student

Mentor: Stephenie Lemon, PhD

Project Title: Pediatric Hypertension: Screening and Management within the UMMHC System



Julie Hugunin, BS

MD/PhD track

Mentor: Kate Lapane, PhD, MS

Project Title: Healthcare Utilization in Youth with Serious Mental Illness



Deborah Mack

Postdoctoral Fellow

Mentor: Jennifer Tjia, MD, MSCE & Kate Lapane, PhD, MS

Project Title: Statin Pharmacotherapy in US Nursing Homes



Attah Mbrah, MPH, PhD

Postdoctoral Fellow

Mentor: Kate Lapane, PhD, MS & Shao-Hsien Liu, PhD

Project Title: Patient, Facility characteristics, and Post-Rehabilitation Outcomes After Joint Replacement Surgery Among Nursing Home Residents: A Systematic Review

Highlights and Achievements

TL1 GRADUATE SPOTLIGHT



Apurv Soni, MD PhD

Assistant Professor and Director,
Program in Digital Medicine
Physician Champion for Digital
Health, UMass Memorial Health
Department of Medicine,
UMass Chan Medical School

“The support I have received through TL1 CCTS training program shaped my career through the formative training it provided in biostatistics, epidemiology, and translational science. Lessons learned during my T11 award period became relevant when I was asked to develop a predictive algorithm for triaging patients to our field hospital during the pandemic and when I was asked to help co-lead the NIH funded RADx Clinical Studies Core and conduct digital site-less studies to advance the science of SARS-CoV-2 Diagnostics.”

“Beyond TL1, I have been fortunate to have support from the CCTS in the form of a pilot project grant that influenced my transition to MD-PhD from a MD program to acquire advanced training in clinical and population health research. Further, subsequently CCTS support allowed me to learn the process of developing digital health technology and understand translational science elements as I developed a device to measure skin-to-skin

care for newborns and deploy mobile technologies in under-served communities of India. Most recently, I have been fortunate to receive support to demonstrate feasibility of administering life saving pulmonary rehabilitation services to COPD patients at home. Taken together, CCTS has fostered my drive for innovation in digital medicine and translational science.”

Learn about Dr. Soni’s work here:

The presence of physician champions improved Kangaroo Mother Care in rural western India

<https://pubmed.ncbi.nlm.nih.gov/27111097/>

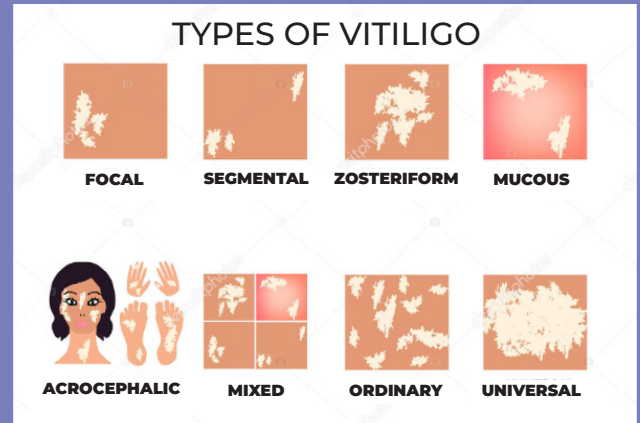
Life saving pulmonary rehabilitation services to COPD patients at home

<https://www.umassmed.edu/news/news-archives/2022/10/umass-chan-and-wellinks-study-mobile-tools-to-keep-copd-patients-healthy/>

Highlights and Achievements

Preparing Engineers for Professional Practice (PEPP)

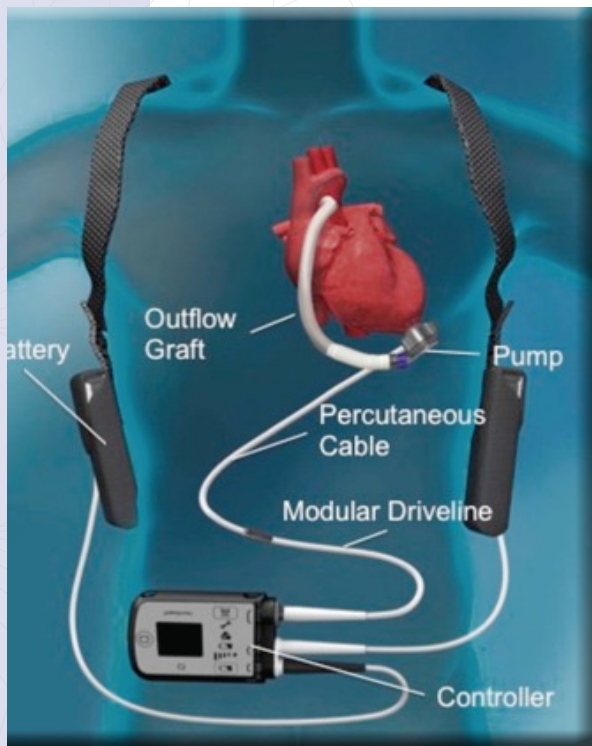
During the 2021-2022 year, UMass Center for Clinical and Translational Science (UMCCTS) and UMass Lowell (UML) successfully implemented a first-time program, called Preparing Engineers for Professional Practice (PEPP), designed to give students skills in carrying out a project in a multidisciplinary team for a designated client, just as practicing engineers. This opportunity was part of the curriculum for engineering students at UML who used this senior design project (two semester course) as a capstone to their degree. By integrating skills developed throughout their undergraduate studies these students worked on solutions for problems statements defined by UMass Chan staff. Topics for problem statements included: At Home Blood Testing, At Home Infectious Disease Testing Unit, Machine Perfusion, VAD Interference and Tracking Vitiligo.



According to Bryan Buchholz, Professor and Chair of Biomedical Engineering at UMass Lowell, “The PEPP program is an excellent opportunity for engineering students, especially those in Biomedical Engineering, to collaborate with clinicians from UMass Chan on the design of prototype medical devices with real world medical applications.”

At the completion of last year’s projects this past April, the Draper Labs and UMass Chan Medical School sponsored a “Biomedical Capstone Senior Design Showcase” at UMass Lowell where students presented their work.

With the success of a pilot program, the program for this academic year has expanded with teams from two UMass campuses showing interest. These teams will once again engage with UMass mentors to complete a senior design project.



“PEPP is a great way to catalyze trans-disciplinary collaboration across disciplines to solve health care problems. We’re happy to expand the program to UMass Amherst and look forward to what the student teams come up with this year,” said Nate Hafer, Director of Operations for the UMCCTS.

*Image above is from the PEPP student project titled - Tracking Vitiligo
UML Student Computer Engineering Team: Matheus Dovale, Jared Gonzales, Adam Hame and Jerald Jay Mateo
Mentor and Sponsor: Professor Weisong Liu, UML Mentor and Andressa Akabane, UMass Chan Sponsor/Client*

*Image at left is from the PEPP student project titled - Ventricular Assist Device (VAD) Interference
UML Student Engineering Team: Michael Adams (CpE), Matthew Palmer (BME), Hari SundaraRaman (CpE), Benjamin Rhodes (ME), Shaniya Seney (EE)
Mentor and Sponsor: Professor Mufeed Mahd and Client: Dr. Jeffrey Shih, UMass Chan Sponsor/Client*

Highlights and Achievements

Clinical Research Professionals Summer Internship



UMCCTS Undergraduate Interns Summer 2022: Left to right - Sophia Nosek (Amherst), Nisha Sabnis (Amherst), Leo Gibbons (Amherst), Marita Merheb (Lowell), Meghan Cusick (Amherst), Ben Weitz (Amherst), Danielle MacCormac (Amherst), Kyra Barry (Lowell), not pictured Shruthi Sivasubramanian (Amherst)

During this past summer, nine UMass undergraduate students participated in summer internship work as part of an inaugural multi-campus collaboration. This internship program was developed to give students from the UMass Amherst School of Public Health & Health Sciences and the UMass Lowell Zuckerberg College of Health Sciences experience in clinical research, and to provide insight into the rewards of a career as a Clinical Research Professional. A major goal of the University of Massachusetts Center for Clinical and Translational Science (UMCCTS) is to develop a rigorously trained workforce that supports high-quality, innovative, and impactful clinical and translational science.

Interns were each paired with a clinical research team and designated Clinical Research Professional (CRP) mentor to train for 10 weeks on the UMass Chan Medical School campus. Following a week of intensive group-level training in clinical research, privacy, and human subjects protection, interns joined their study teams to engage in hands-on, behind the scenes learning about all phases of the clinical research process. The interns were also treated to weekly panel discussions with UMass faculty and staff, engaging in dialogue about topics such as Implementation Science, Community Engagement, Digital Medicine and Clinical Informatics.

“I have never worked anywhere like UMass Chan. From beginning to end, I knew that I was a valued member of the team. I got to see so much more of the clinical research process than I ever anticipated, and everyone I talked to was always happy to teach me what I didn’t know. I feel this research experience has brought me closer to a career in clinical research. I am excited to see where both my experience in this program and the connections that I’ve made take me.”

Benjamin Weitz, UMass Amherst, Math & Public Health, CCTS Undergrad Intern, Health Informatics & Implementation Science

Community Engagement and Collaboration Core (CECC)

The CECC had a very productive year integrating community engagement and team science into educational programs and workforce development, enhancing the scale, scope and impact of collaborative research, and contributing to the advancement of the science and practice of collaboration and community engagement across the CTSA consortium. The CECC expanded its emphasis on the translational spectrum and provided 12 consultations to researchers, including the RADx Tech Clinical Studies Core and KL2 scholars.

The CECC held several educational and workforce development workshops in FY 22. For example, a two-part series of workshops in Community Engagement was offered in collaboration with the Public Health Institute of Western Massachusetts. The two workshops had a total attendance of 97 participants entitled “Building Community-Academic Research Partnerships” and “Addressing Health Equity through Community Engagement and Research”.

The CECC participated in the Massachusetts Community Engagement and Research Learning Community, a collaborative effort with UMass, Tufts University, Harvard University, and Boston University, with shared community engagement training objectives. This past year the collaborative held a state-wide COVID-19 symposium. In addition, it initiated a joint project with the Massachusetts DPH to address needs and prepare local health departments in making Structural and Societal Determinants of Health (SSDoH) data more accessible for researchers and developing a common data model for health equity research.



STRIDE

Strengthening Translational Research In Diverse Enrollment.



The CECC continues their collaborative work on the STRIDE Project (Strengthening Translational Research in Diverse Enrollment) providing tools for enhancing the informed consent process and participation of under-represented groups in research. STRIDE is a collaborative effort with University of Alabama School of Medicine and Vanderbilt University. STRIDE components have been disseminated locally, nationally, and internationally. The STRIDE website (www.strideproject.org) was built out with implementation support materials and transitioned to UMass Chan control. As of October 2022, STRIDE has over 3 million eConsent transactions and over 3,090 Institutions are using the REDCap eConsent framework.

Science Participation Resource Center (SPRC)

The goal of SPRC is to promote recruitment and retention of diverse study participants. SPRC's work is grounded on enhancing research literacy by providing culturally appropriate information about research participation opportunities. This includes participation in community events, integration into patient portals, and a digital and social media presence. In addition, SPRC trains research teams in cultural competency and assists investigators across the UMass campuses to develop recruitment and retention plans designed to enhance participation of diverse communities using approaches by addressing key factors (e.g., culture, literacy, language barriers) during the application and protocol development process.

Key accomplishments:

- 8 successful consultations/3 (inter)national presentations
- 6-Campus Community of Practice
- Quarterly meetings with good representation
- Brainstorming about recruitment difficulties
- Advances in translational science
- Enhanced online presence (<https://www.diversityinresearch.org>)
- Storytelling
- Simulation
- Artful Determinants of Health

Biomarker Core: Proteomics/Olink

The Biomarkers Core has been in a building phase, acquiring the equipment and expertise to offer proteomics biomarker discovery opportunities for investigators at UMass Chan. In addition, the core extended their expertise to two additional advanced techniques, merFISH and live tissue sectioning and culture. Biomarker expertise and services support translational research projects to define human disease as well as understand disease mechanisms, and develop new treatments in an efficient manner.

The core offers training for investigators in biomarker discovery, -omics integration, spatial transcriptomics, and live tissue sectioning to support advanced translational research projects. This includes consult sessions with investigators 1-on-1, as well as larger sessions to educate investigators about proteomics and other techniques as they come online.

Services offered:

- Access to Olink proteomics analysis for human fluids
- Spatial transcriptomics using Multiplexed error-robust fluorescence in situ hybridization (merFISH) – SCOPE core
- Access to merFISH assays in human tissues
- Optimization and application of live tissue sectioning through Compresstome and culture for human tissue assays

Clinical Research

450

Studies Supported in FY 22

Therapeutic.....**329**

Non-Therapeutic.....**121**

COVID-related.....**36**

160

**Principal
Investigators Supported**

3137

Enrollments

Therapeutic **1328**

Non-Therapeutic **1809**

29

**Departments/
Centers Supported**

Clinical Research Center

58

Studies supported

10

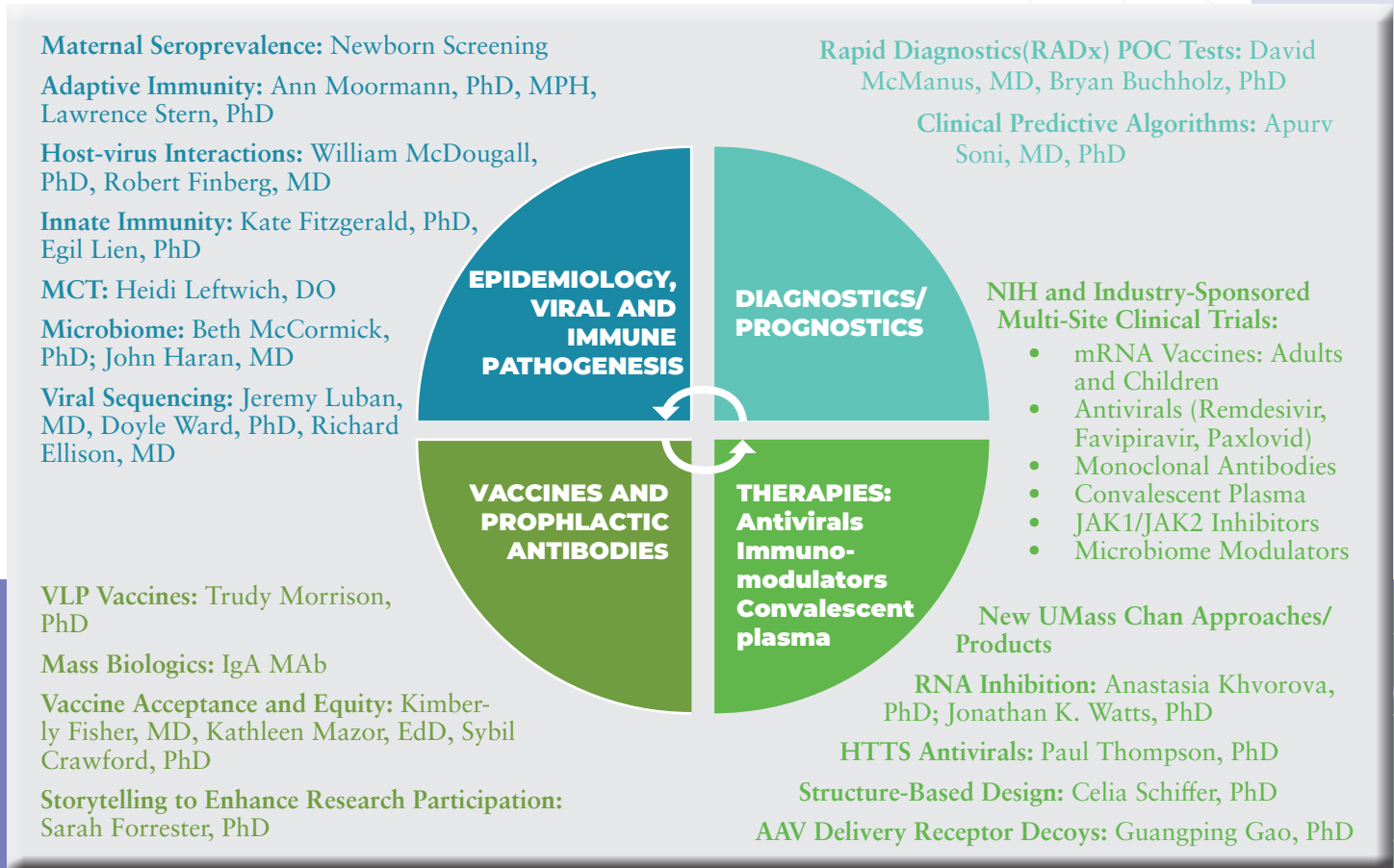
Departments Supported

30

PIs supported

COVID-19 Research

The UMCCTS supported a broad range of SARS-CoV-2 related research through Clinical Research Services, Funding, Cores, and Education and Training.



Rapid Acceleration of Diagnostics (RADx®)

The RADx initiative is an NIH-convened public-private partnership (UMass Chan Medical School, UMass Lowell, NIH-National Heart, Lung, and Blood Institute, and NIH- National institute of Biomedical Imaging and Bioengineering) with the goal of developing and implementing COVID-19 diagnostics. The RADx Tech Clinical Studies Core, led by David McManus, MD (former KL2 Scholar), Laura Gibson, MD (from 2020 - 2021), Apurv Soni, MD, PhD and John Broach, MD, MBA, MPH, oversees the clinical studies component of point-of-care and home-based diagnostics for COVID-19. The RADx Tech Clinical Studies Core Logistics Team is led by Nathaniel Hafer, PhD. Findings from the RADx studies have been published and have provided guidance to regulatory authorities as well as the public about the correct usage of home-based COVID-19 tests.

UMCCTS supported the RADx program in the form of overall administration, IRB, Informatics, Biorepository, Community Engagement, and the Quantitative Methods Core.

Read more details here:

<https://www.fda.gov/medical-devices/safety-communications/home-covid-19-antigen-tests-take-steps-reduce-your-risk-false-negative-results-fda-safety>

<https://pubmed.ncbi.nlm.nih.gov/35982680/>

<https://pubmed.ncbi.nlm.nih.gov/36215709/>

COVID-19 Research

COVID-19 Variant Surveillance and Social Determinants in Central MA

Another effort which was strongly supported by the UMCCTS was the COVID-19 Variant Surveillance and Social Determinants in Central Massachusetts dashboard. The project was a collaborative effort spearheaded by the Center for Microbiome Research and included investigators from UMass Chan, UMass Amherst, and UMass Dartmouth, and the Massachusetts Department of Public Health (MDPH).

Working with the UMass Memorial Clinical Lab, the UMCCTS supported Biorepository and Tissue Bank accumulated around 29,000 plasma, nasopharyngeal, and saliva remnant specimens obtained from patients with documented SARS-CoV-2 infection.

The investigators from Center for Microbiome Research performed SARS-CoV-2 sequencing on the specimens and collaborated with Informatics core to map the geo distribution of the variants. The variant data was incorporated into a dashboard along with the census, the Massachusetts vaccine database, social vulnerability databases from MDPH in order to track the emergence of variants in our local community, allowing correlation of vaccination rates in specific communities. *

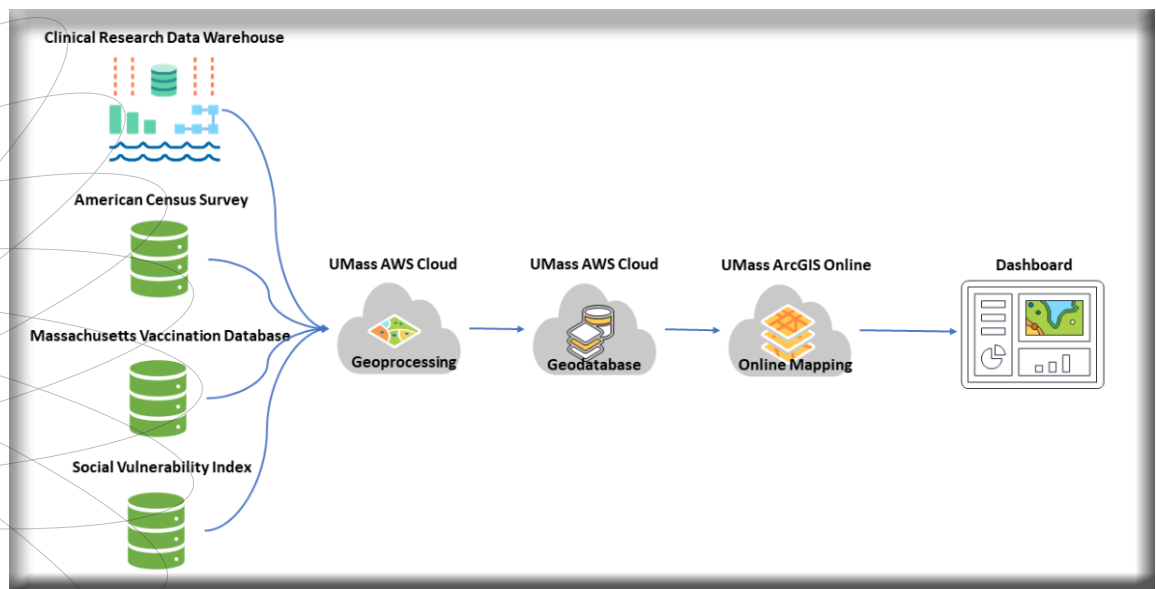
**Shi et al, JMIR Formative Research, 2022*

Informatics

Our goal: “To empower every UMass Chan researcher to improve healthcare using informatics and analytics.”

Over the past year, the Research Informatics Core worked to streamline operational services by unifying the Data Science Core, the Informatics Core, and the Recruitment Core into one core. This approach will allow for concierge service for researchers, by reducing the barriers to access services, implementing an internal project management system, and assisting researchers with the data use agreements.

The Informatics team has been working to establish cross-collaboration between UMass Chan and UMass Memorial to address challenges in obtaining data from across multiple data sources (for example EHR, Omics, Imaging, device data, web logs). The goal would be to create a research informatics infrastructure that supports the concept of a “Learning Health System” which would systematically gather evidence to apply to improvements in health care.



Biostatistics, Epidemiology, and Research Design (BERD)

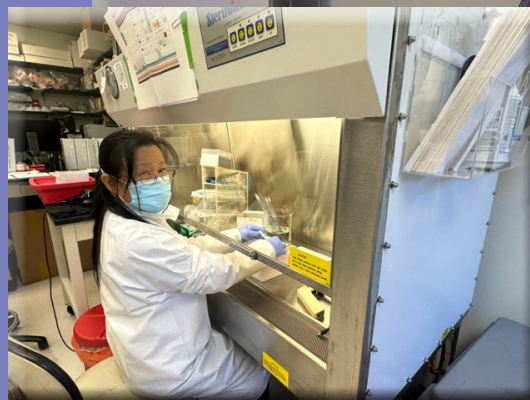
BERD Consultations

- ⇒ Reached milestone of 3000+ consultations since May 2010
- ⇒ Provided support for three first-in-humans Phase Ib/IIa trials
- ⇒ Provided support for five NIH R01 applications
- ⇒ Held Weekly Methods seminars to discuss innovation in research methods from Human Subject Research and Randomized Clinical Trials
- ⇒ Integrating skills with the Research Informatics Core to provide “conveyor belt” of data access and analysis
- ⇒ Developed a census-tract-level summary index, based on 9 dimensions of neighborhood features (e.g., transportation, education, (un)employment) – that more closely tracks measures of community health, including mean life expectancy and the prevalence of chronic disease, than widely-used indices, such as the Area Deprivation Index

Biospecimen, Tissue and Tumor Bank

The UMCCTS Biospecimen, Tissue, and Tumor Bank (Biorepository) supports investigators in patient-oriented research and has the capability to process, store, ship, and disburse specimens. The core collaborated with UMass Memorial Health to obtain discarded blood, saliva, and nasal swab specimens for use in research, including specimens for SARS-CoV-2 research. Examples of projects that used these specimens:

- ⇒ UMass Chan Medical School Newborn Screening Program examined maternal seroprevalence in > 70,000 newborn dried blood spot specimens in collaboration with the Massachusetts Department of Public Health, used to model general SARS-CoV-2 seroprevalence across Massachusetts: <https://pubmed.ncbi.nlm.nih.gov/35213690/>
- ⇒ Supported by the UMCCTS Informatics Core and Tissue Bank/Biorepository, the UMass Center for Microbiome Research is conducting real-time SARS-CoV-2 genomic surveillance testing and variant geo-mapping over time*
- ⇒ In addition, the Biorepository provided services for 16 clinical vaccine or therapeutic trials, handling over 1300 specimens



Pictured above are some of the freezers used to store specimen samples located in the Biotech 1 building bio-repository.

Pictured above is Hong Bing Chen, Research Associate, processing samples under the lab's bio-safety cabinet.

*Shi et al, JMIR Formative Research, 2022

Pilot Awards

2022 PPP (Award Project Titles, PIs and Collaborators)

Automatic Wide-field Optical Imaging for Transplant Organ Viability Assessment

Yu Chen, PhD - UMass Amherst

Babak Movahedi MD, PhD - UMass Chan Medical School

Haichong Zhang PhD
Worcester Polytechnic Institute (WPI)

A Deep Learning-Based Real-Time Vascular Anatomy Assessment Tool for Emergency Stroke Interventions

Anna Luisa Kuhn MD, PhD - UMass Chan Medical School

Mohammed Salman Shazeeb PhD - UMass Chan Medical School

Clifford Grant Lindsay PhD - UMass Chan Medical School

Isolated Single Islet Studies to Define the Factors Underlying the Heterogeneity of Islet and Peri-Islet Lymphocytic Infiltration in Human Type 1 Diabetes

David M Harlan MD - UMass Chan Medical School

Yihao Zheng PhD - Worcester Polytechnic Institute (WPI)

Sally C. Kent PhD - UMass Chan Medical School

Sambra Redick PhD - UMass Chan Medical School

Correction of Defective Splicing in Fragile X Syndrome with Therapeutic Potential

Joel Richter PhD
UMass Chan Medical School

Dissecting Optical Coherence Tomography Features to Predict Risk of Future Advanced Age-related Macular Degeneration

Tianxiao Huan PhD - UMass Chan Medical School

Johanna M. Seddon MD, ScM - UMass Chan Medical School

Yu Chen PhD - UMass Amherst

Pilot Awards

2022 PPP (Award Project Titles, PIs and Collaborators)

Tinnitus Characterization Using Reverse Correlation with Applications to Retraining Therapies

Adam Lammert PhD
Worcester Polytechnic Institute (WPI)

Divya Chari MD
UMass Chan Medical School

STING Agonism for the Treatment of COVID-19

Katherine A Fitzgerald PhD
UMass Chan Medical School

Fiachra Emanuel Humphries PhD
UMass Chan Medical School

Pilot Awards

2021 PPP (Award Project Titles, PIs and Collaborators)

Roles of Cutaneous T Peripheral Helper Cells in Photo-sensitivity of Dermatomyositis

Mehdi Rashighi Firoozabadi, MD
UMass Chan Medical School

Jillian Richmond, PhD - UMass Chan Medical School

Megan Orzalli, PhD - UMass Chan Medical School

Understanding Barriers to COVID-19 Vaccine Equity

Kimberly A Fisher, MD - UMass Chan Medical School

Kathleen M. Mazor, EdD - UMass Chan Medical School

Sybil Crawford, PhD - UMass Chan Medical School

Screening and Optimization of Luotonin Based Leads for Anti-Fungal and Anti-Helminths

Mostafa Elfawal, PhD - UMass Chan Medical School

Reeta Rao, PhD - Worcester Polytechnic Institute (WPI)

Sivappa Rasapalli, PhD - UMass Dartmouth

Testing siRNA Therapeutics for the Treatment of Age-Related Macular Degeneration

Claudio Punzo, PhD - UMass Chan Medical School

Pilot Awards Spotlight

Examining Factors Governing T Lymphocyte Migration to the Skin During Cutaneous Lupus Erythematosus

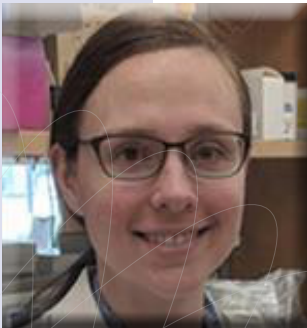
Jillian Richmond, PhD
UMass Chan Medical School

Mehdi Rashighi Firoozabadi, MD
UMass Chan Medical School

Cutaneous lupus erythematosus (CLE) is a heterogeneous group of autoimmune diseases with a broad range of skin and mucosal tissue manifestations. CLE subtypes have varying degrees of association with systemic lupus erythematosus (SLE): not all SLE patients develop skin lesions, and not all

CLE patients will later progress to SLE. This highlights differences in organ manifestation and disease pathogenesis that will be important to elucidate in order to design tailored treatment options. The overall objective of the project was to identify cellular and molecular mechanisms coordinating skin involvement in lupus to better understand the pathogenesis. With this understanding, novel treatment targets for both skin-limited and systemic lupus could be identified.

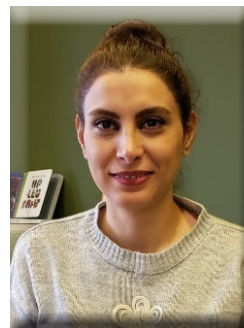
Results from the pilot were recently published in Frontiers in Immunology. (Haddadi NS et al, Front Immunol. 2022)



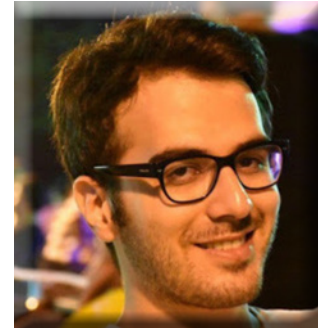
Jillian Richmond,
PhD



Mehdi Rashighi
Firoozabadi, MD



Nazgol-Sadat
Haddadi, MD, MPH



Khashi Afshari,
MD, MPH

(The funding also helped to support several trainees.)

Benefits Aligned with the Translational Science Benefit Model

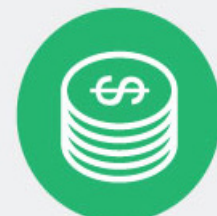
<https://translationalsciencebenefits.wustl.edu/>



CLINICAL



COMMUNITY



ECONOMIC

Research Infrastructure

Bioinformatics Support	Pilot grants
Biorepository & Tissue Bank	Proteomics/OLink (BioMarkers)
Biostatistics, Epidemiology, and Research Design (BERD)	Facility
Clinical Research Center	Recruitment Support
Clinical Research Implementation Support	Research Navigator
Research Informatics Core	Small Molecule Screening Facility
Investigational Drug Services	Science Participation Research Center (SPRC)
M2D2	Umbilical Cord Blood Facility

Translational Workforce Development

Human Research Protection Program (HRPP) Quality Assurance/Quality Improvement
I-Corps Program at the UMCCTS
Master of Science in Clinical Investigation Program
Pre- and Post-doctoral Fellowship (TL1) Training Program
“K-Club”- Research Career and Writing Group
“R-Club” Writing Group
Mentored Career Development (KL2) Training Program
Millennium PhD Program
Junior Faculty Development Program
Clinical and Population Health Research PhD Program
Clinical/Translational Research Pathway Program
MD/PhD (MSTP) Program
High School Health Careers Program (HSHCP)
Worcester Pipeline Collaborative
CCTS Summer Undergraduate Research Internship Program (Clinical & Translational Science)
Morningside Summer Undergraduate Research Program (Lab Research)
Summer Enrichment Program (SEP)

Community Engagement

Community Engagement Consults
Community Engagement Studios
Public Engagement Program
Virtual Workshops
CIRTification Online Training

UMCCTS Leadership, Operations, Services

EXECUTIVE LEADERSHIP

Katherine Luzuriaga, MD
PI & Director

Terence Flotte, MD
Co-Director

CORE LEADERSHIP

3-D Printing Core

Nathaniel Hafer, PhD | Director
Ugur Celik, PhD | Lead Scientist

Bio-informatics Core

Manuel Garber, PhD | Director

Biospecimen, Tissue and Tumor Bank

Karl Simin, PhD | Director

Clinical Research Center

Bethany Trainor, RN | Nurse Manager

Investigational Drug Service

TBD - Manager

Office of Clinical Research

Danielle Howard | Director

QA/QC Program

Jan Nissly, PhD | Director

Small Molecule Screening Facility

Paul Thompson, PhD | Director

Umbilical Cord Blood Core

Tiffany Moore Simas, MD, MPH,
MEd, FACOG | Director

PROGRAM LEADERSHIP

Biostatistics, Epidemiology & Research Design (BERD)

Bruce Barton, PhD | Director
Arlene S. Ash, PhD | Co-Director
Sharina Person, PhD | Co-Director

Community Engagement and Collaboration Center (CECC)

Stephenie Lemon, PhD, MS | Director
Maryann Davis, PhD | Co-Director
Laura L. Hayman, PhD | Co-Director

Educational and Training Programs

M. Diane McKee, MD | Director

Integrated Biomarkers

John E. Harris, MD, PhD | Director

(KL2) Mentored Career Development Program

Catarina Kiefe, MD, PhD | Director
Peter Lindenauer, MD, MSC, MHM | Co-Director
Beth McCormick, PhD | Co-Director
Milagros C. Rosal, PhD | Co-Director

(TL1) NRSA Training Program

Kate L. Lapane, PhD, MS | Director
Brian Lewis, PhD | Co-Director

Pilot Project Program (PPP)

Nathaniel Hafer, PhD | Director

Regulatory Knowledge and Support

Jesica Pagano-Therrien, PhD, RN,
CPNP-PC | Director

Institutional Review Board

Allison Blodgett, PhD | Director

Research Informatics

Adrian Zai, MD, PhD | Director

Science Participation Research Center

Jeroan Allison, MD, MSc | Director
Joanne Calista, MSW | Co-Director